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GRASSHOPPER CONTROL PLANS
BASED ON RESULTS OF SURVEYS

Grasshopper outbreaks are far less terrifying today than they were in the seventies, when swarms of "locusts," as they were called in those days, swooped down in great clouds, with no advance warning, to devour the early settlers' crops. Annual surveys by the U. S. Department of Agriculture and cooperating agencies now eliminate the element of surprise from these outbreaks by providing information for official forecasts of where, when, and how many hoppers may be expected each year. New insecticides and new equipment for applying them over wide tracts of land, from the ground and from the air, are available for keeping young hoppers from spreading very far from their hatching grounds. When the outbreak is too big to be met by farmers alone, Federal and State agencies launch large-scale control campaigns. The 1948 surveys show that grasshoppers by the billions are to be expected in wide areas of the United States in 1949 (1)*.

Grasshopper surveys are made three times a year. The first, in late summer, shows where adults of various species are concentrated, so that entomologists know where to look for eggs in the second survey, which is the most important index to the next year's brood. A third survey the following spring or early summer shows when eggs reach the hatching stage, thus pointing out where greatest grasshopper damage may be expected and providing a time table for control measures in those places.

Grasshopper egg surveyors count the egg pods in a certain number of places in a certain number of fields in each county where hoppers are a serious economic pest. The eggs are in long, slim pods - sometimes as many as 100 to the pod - thrust down into the soil by the female (2)*. The method of sampling depends on the kind of grasshoppers in the area being surveyed. Each species has its own favorite egg-laying spots, which call for individual sampling tools and procedures.

In stubblefields and soil-blown fence rows, where the lesser migratory grasshopper likes to lay its eggs, the surveyor uses a converted scoop shovel, with the sides turned up and blade sharpened to take a sample 3 inches deep, 6 inches wide, and a foot long. He sifts two one-half square foot samples of surface dirt through a galvanized iron wire screen (3)* and records the number of egg pods left on the screen as so many per square foot (4)*.

In more heavily sodded locations - usually along field margins - favored by the differential and the two-striped hoppers, egg pods are brought to light by cutting out pieces of sod, with a sharp, stiff spade or shovel, to a depth of 3 inches, and separating the egg pods from among the plant roots (5)*. The count on these eggs is recorded as so many pods per square foot.

In some places, such as bare spots in alfalfa fields and soddy pastures, the egg pods may be exposed for the count merely by shaving off the surface of the ground with a short mason's trowel ground to a razor sharp edge (6,7)*.

Some grasshoppers lay their eggs among single-stalk plants, like sweet clover, sunflowers, and dandelions, or among isolated clumps of bunchgrass, such as pigeongrass or foxtail, wheat-grass, and sandbur. These egg pods are scooped up, sifted from the soil, and recorded in the same manner as pods found in stubblefields.

Each field or other area surveyed for grasshopper eggs receives a numerical rating based on the results of the survey - 1 for a normal infestation; 2 for a light infestation; 3 for a moderate infestation; 4 for a heavy infestation; 5 for a very heavy infestation. By means of a special conversion table, these ratings are translated into percentages of infestation. The average of these percentages in any one county is the county percent factor (8)*. This factor is used as one guide in estimating the amount of grasshopper bait or other materials needed to control the hoppers expected to develop from the eggs known to be in the ground. Other factors considered in making this estimate include local conditions of weather and topography, the acreage of crops susceptible to grasshopper damage, and the past history of the county in controlling similar hopper outbreaks.

Maps that show the degree and extent of infestation are prepared from the numerical ratings. The colors green, yellow, blue, and red have been assigned the ratings of 2,3,4, and 5, respectively. Each rating is spotted on a large United States map in its proper color. Then the pattern for the infestation map is drawn in, using the colored spots as guides (9)*. The completed map, together with supplementary information, serves as a guide to Federal and State officials in planning for the coming grasshopper control campaign (10)*.

*Numbers in parentheses refer to pictures on other side, 8 by 10 glossy prints of which are free to writers and editors on request to Press Service, Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

